composite (NMHC+NO_X) and optional composite CO standards shall be computed by the following formulas.

(i) $Y_{WSFTP} = 0.72(Y_{FTP})+0.28(Y_{US06})$

Where:

(A) Y_{WSFTP} = Mass emissions per mile for a particular pollutant weighted in terms of the contributions from the FTP and US06 schedules. Values of Y_{WSFTP} are obtained for each of the exhaust emissions of NMHC, NO_X and CO.

(B) Y_{FTP} = Weighted mass emissions per mile (Ywm) based on the measured driving distance of the FTP test schedule.

(C)(*1*) Y_{US06} = Calculated mass emissions per mile based on the measured driving distance of the US06 test schedule; or,

(*2*) In the case of a 2-phase US06 test run according to the provisions of § 86.159–08(f)(2) and part 600 of this chapter:

YUS06 = Calculated mass emissions per mile, using the summed mass emissions of the ''US06 City'' phase and the ''US06 Highway'' phase, based on the measured driving distance of the US06 test schedule. The ''US06 City'' phase shall be sampled during seconds 0–130 and from 495 seconds until five seconds after the engine stops running (*e.g.* 602 or 603 seconds) of the US06 driving schedule. The ''US06 Highway'' phase shall be sampled during seconds 130–495 of the US06 driving schedule),

(ii) Composite (NMHC+NO_X) = Y_{WSFTP}(NMHC) + Y_{WSFTP}(NO_X)

Where:

(A) Y_{WSFTP}(NMHC) = results of paragraph (c)(2)(i) of this section for NMHC.

(B) Y_{WSFTP}(NO_X) = results of paragraph (c)(2)(i) of this section for NO_X.

(d) The NO_X humidity correction factor for adjusting NO_X test results to the environmental test cell air conditioning ambient condition of 100 grains of water/pound of dry air is:

K_H (100) = 0.8825/[1–0.0047(H–75)]

Where:

H = measured test humidity in grains of water/pound of dry air.

[71 FR 77922, Dec. 27, 2006, as amended at 74 FR 61548, Nov. 25, 2009]

§ 86.165–12 Air conditioning idle test procedure.

(a) *Applicability.* This section describes procedures for determining air conditioning-related CO_2 emissions from light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles. The results of this test are used to qualify for air conditioning efficiency CO_2 credits according to § 86.1866–12(c).

(b) *Overview.* The test consists of a brief period to stabilize the vehicle at idle, followed by a ten-minute period at idle when CO_2 emissions are measured without any air conditioning systems operating, followed by a ten-minute period at idle when CO_2 emissions are measured with the air conditioning system operating. This test is designed to determine the air conditioning-related CO_2 emission value, in grams per minute. If engine stalling occurs during cycle operation, follow the provisions of § 86.136–90 to restart the test. Measurement instruments must meet the specifications described in this subpart.

(c) *Test cell ambient conditions.* (1) Ambient humidity within the test cell during all phases of the test sequence shall be controlled to an average of 40–60 grains of water/pound of dry air.

(2) Ambient air temperature within the test cell during all phases of the test sequence shall be controlled to 73–80 °F on average and 75 ± 5 °F as an instantaneous measurement. Air temperature shall be recorded continuously at intervals of not more than 30 seconds.

(d) *Test sequence.* (1) Connect the vehicle exhaust system to the raw sampling location or dilution stage according to the provisions of this subpart. For dilution systems, dilute the exhaust as described in this subpart. Continuous sampling systems must meet the specifications provided in this subpart.

(2) Test the vehicle in a fully warmed-up condition. If the vehicle has soaked for two hours or less since the last exhaust test element, preconditioning may consist of a 505 Cycle, 866 Cycle, US06, or SC03, as these terms are defined in § 86.1803–01, or a highway fuel economy test procedure, as defined in § 600.002–08 of this chapter. For soak

periods longer than two hours, precondition the vehicle using one full Urban Dynamometer Driving Schedule. Ensure that the vehicle has stabilized at test cell ambient conditions such that the vehicle interior temperature is not substantially different from the external test cell temperature. Windows may be opened during preconditioning to achieve this stabilization.

(3) Immediately after the preconditioning, turn off any cooling fans, if present, close the vehicle's hood, fully close all the vehicle's windows, ensure that all the vehicle's air conditioning systems are set to full off, start the CO_2 sampling system, and then idle the vehicle for not less than 1 minute and not more than 5 minutes to achieve normal and stable idle operation.

(4) Measure and record the continuous CO_2 concentration for 600 seconds. Measure the CO_2 concentration continuously using raw or dilute sampling procedures. Multiply this concentration by the continuous (raw or dilute) flow rate at the emission sampling location to determine the CO_2 flow rate. Calculate the CO_2 cumulative flow rate continuously over the test interval. This cumulative value is the total mass of the emitted CO_2. Alternatively, CO_2 may be measured and recorded using a constant velocity sampling system as described in §§ 86.106–96(a)(2) and 86.109.

(5) Within 60 seconds after completing the measurement described in paragraph (d)(4) of this section, turn on the vehicle's air conditioning system. Set automatic air conditioning systems to a temperature 9 °F (5 °C) below the ambient temperature of the test cell. Set manual air conditioning systems to maximum cooling with recirculation turned off, except that recirculation shall be enabled if the air conditioning system automatically defaults to a recirculation mode when set to maximum cooling. Continue idling the vehicle while measuring and recording the continuous CO_2 concentration for 600 seconds as described in paragraph (d)(4) of this section. Air conditioning systems with automatic temperature controls are finished with the test after this 600 second idle period. Manually controlled air conditioning systems must complete one additional idle period as described in paragraph (d)(6) of this section.

(6) This paragraph (d)(6) applies only to manually controlled air conditioning systems. Within 60 seconds after completing the measurement described in paragraph (d)(5) of this section, leave the vehicle's air conditioning system on and set as described in paragraph (d)(5) of this section but set the fan speed to the lowest setting that continues to provide air flow. Recirculation shall be turned off except that if the system defaults to a recirculation mode when set to maximum cooling and maintains recirculation with the low fan speed, then recirculation shall continue to be enabled. After the fan speed has been set, continue idling the vehicle while measuring and recording the continuous CO_2 concentration for a total of 600 seconds as described in paragraph (d)(4) of this section.

(e) *Calculations.* (1) For the measurement with no air conditioning operation, calculate the CO_2 emissions (in grams per minute) by dividing the total mass of CO_2 from paragraph (d)(4) of this section by 10.0 (the duration in minutes for which CO_2 is measured). Round this result to the nearest tenth of a gram per minute.

(2)(i) For the measurement with air conditioning in operation for automatic air conditioning systems, calculate the CO_2 emissions (in grams per minute) by dividing the total mass of CO_2 from paragraph (d)(5) of this section by 10.0. Round this result to the nearest tenth of a gram per minute.

(ii) For the measurement with air conditioning in operation for manually controlled air conditioning systems, calculate the CO_2 emissions (in grams per minute) by summing the total mass of CO_2 from paragraphs (d)(5) and (d)(6) of this section and dividing by 20.0. Round this result to the nearest tenth of a gram per minute.

(3) Calculate the increased CO_2 emissions due to air conditioning (in grams per minute) by subtracting the results of paragraph (e)(1) of this section from the results of paragraph (e)(2)(i) or (ii) of this section, whichever is applicable.

(f) The Administrator may prescribe procedures other than those in this section for air conditioning systems and/

or vehicles that may not be susceptible to satisfactory testing by the procedures and methods in this section. For example, the Administrator may prescribe alternative air conditioning system settings for systems with controls that are not able to meet the requirements in this section.

[75 FR 25680, May 7, 2010, as amended at 76 FR 39521, July 6, 2011; 77 FR 63152, Oct. 15, 2012]

86.166–12 [Reserved]

§ 86.167–17 AC17 Air Conditioning Emissions Test Procedure.

(a) *Overview.* The AC17 test procedure consists of four elements: a pre-conditioning cycle, a 30-minute soak period under simulated solar heat, followed by measurement of emissions over an SC03 drive cycle and a Highway Fuel Economy Driving Schedule (HFET) drive cycle. The vehicle is preconditioned with a single UDDS to bring the vehicle to a warmed-up stabilized condition. This preconditioning is followed by a 30 minute vehicle soak (engine off) that proceeds directly into the SC03 driving schedule, during which continuous proportional samples of gaseous emissions are collected for analysis. The SC03 driving schedule is followed immediately by the HFET cycle, during which continuous proportional samples of gaseous emissions are collected for analysis. This entire sequence is conducted in an environmental test facility. Vehicles are tested for any or all of the following emissions, depending upon the specific test requirements and the vehicle fuel type: gaseous exhaust THC, NMHC, NMOG, CO, NO_X, CO_2, N_2O, CH_4, CH_3OH, C_2H_5OH, C_2H_4O, and HCHO. For purposes of measuring the impact of air conditioning systems on CO_2 emissions, this sequence is run twice: once with air conditioning on and once with air conditioning off. The following figure shows the basic sequence of the test procedure.

(b) *Equipment requirements.* Equipment requirements are specified in subpart B of part 86 of this chapter.

(c) *Fuel specifications.* The test fuel specifications are given in § 86.113. Test fuels representing fuel types for which there are no specifications provided in § 86.113 may be used if approved in advance by the Administrator.

(d) *Analytical gases.* The analytical gases must meet the criteria given in § 86.114.

(e) *Driving cycles.* (1) The driving schedules for the EPA Urban Dynamometer Driving Schedule (UDDS) and the SC03 cycle are contained in appendix I of this part. The driving schedule for the Highway Fuel Economy Driving Schedule (HFET) is set forth in appendix I of part 600 of this chapter.

(2) The speed tolerance at any given time on the driving schedules is defined by upper and lower limits. The upper limit is 2 mph higher than the highest point on trace within 1 second of the given time. The lower limit is 2 mph lower than the lowest point on the trace within 1 second of the given time. Speed variations greater than the tolerances (such as may occur during gear changes) are acceptable provided they occur for less than 2 seconds on any occasion. Speeds lower than those prescribed are acceptable provided the vehicle is operated at maximum available power during such occurrences.

(f) *Equipment calibration.* The equipment used for fuel economy testing must be calibrated according to the provisions of § 86.116.

(g) *Vehicle preparation.* The vehicle shall be prepared for testing according to § 86.132(a) through (g), concluding with a 12–36 hour soak.

(h) *Dynamometer procedures.* (1) The AC17 test procedure consists of a preconditioning UDDS, a 30-minute soak period under simulated solar heat, followed by measurement of emissions over an SC03 drive cycle and a Highway Fuel Economy Driving Schedule (HFET) drive cycle.

(2) Except in cases of component malfunction or failure, all emission control systems installed on or incorporated in a new motor vehicle must be functioning during all procedures in this subpart. The Administrator may authorize maintenance to correct component malfunction or failure.

(3) Use § 86.129 to determine road load power and test weight. The dynamometer's horsepower adjustment settings shall be set such that the force